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THE ILLINOIS ENGINEER, MARCH, 1956—VOLUME XXXII, NO. 3

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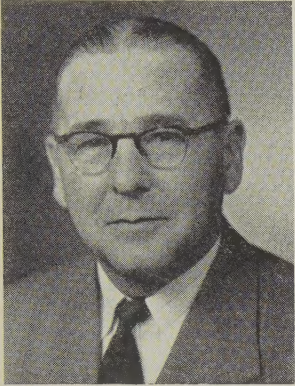
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Of Interest to I. S. P. E.

PRESIDENT'S MESSAGE

There are many reasons why you should attend the 71st Annual Convention of the Illinois Society of Professional Engineers on April 12, 13 and 14th, 1956 at the Moraine Hotel, Highland Park, Illinois.



President Wallace

First:—The Lake County Chapter, who is the host Chapter, has given freely and generously of their time and finances to assure a successful convention and you are personally and professionally obligated to give some of your time to attend.

Second:—It is necessary that the Professional Engineer have his mind recharged and revitalized with new and up-to-date ideas on Professional Engineering education programs, Ethics and Practice policies, Membership, Public Interests and new Legislation for the betterment of his Profession.

Third:—Meet with your fellow Engineers, as this is an Annual Meeting of good fellowship both socially and professionally. Some of us have veered unknowingly into a rut, a rut of self-interest, self-pity and uncertainty. It is time for all of us to renew our faith in a unified profession, for in unity we have strength and stature, and only through unity shall we attain our goals.

Fourth:—The ISPE is your Society, and the growth and success of the Society this coming year and the following years will be dependent on your support, your voice and your attendance.

Fifth:—It is the time and the place for you to reconsecrate and rededicate not only yourself but your profession to and for the betterment of all mankind.

SEE YOU AT THE CONVENTION.

DWAIN M. WALLACE, *President*

Cover Picture

On the cover this month is a picture of Portland Cement Association's Research and Development Division Building. This new laboratory, the only one of its kind in the world, does much of the research for development of new uses for the whole cement industry. An inspection trip is planned for the afternoon of Thursday, April 12th. Buses will run from the Moraine Hotel to the laboratory and if you have not seen this building it will be worth your while to visit it on Thursday.

Vox Secretarii

By P. E. ROBERTS, *Executive Secretary*

National Engineers Week

All the Chapters who participated in National Engineers Week last year were again active this year and a couple of Chapters actively participated for the first time. The coverage by television in Champaign, Chicago, and Springfield plus radio in practically every part of the state gave the listeners the story. News stories, pictures, and special sections far exceeded the coverage in 1955. Proclamation was made by the Governor and by many mayors throughout the state. Summing up, the publicity obtained during the week was excellent. However, the greatest value of Engineers Week is in the participation by literally hundreds of members of the Society. Those Chapters who are not participating in Engineers Week activities should, by all means, include it in their next year's Chapter activities.

Annual Meeting

Elsewhere in this issue, you will find much about the Annual Meeting. At press time, it was not definitely known who the speaker for the Thursday night dinner would be. However, since Governor Stratton is making the address on Friday evening at the Annual Banquet, Lake County Chapter is striving to keep the meeting in balance politically by having a prominent Democrat speak on Thursday evening. The theme of the 70th Annual Meeting at Rockford was "Engineers in Industry." While it has not been stated, the theme of the 71st Annual Meeting at Highland Park could be "Engineers' Interest in Political Activity." This is a particularly apropos theme since 1956 is a presidential election year.

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Ladies Auxiliary

On Saturday, February 25th, the ladies of the Peoria Chapter held their Charter presentation night and it was with considerable satisfaction that President Wallace presented the Charter to the first President of the Peoria Ladies Auxiliary, his wife, Mrs. Caroline Wallace. The affair was very well attended and the program was excellent, headlined by a very well done book review.

Miscellany

A record of twenty-seven applications plus five transfers appeared on the February ballot. . . . The Illini basketball team met its Waterloo at Columbus, on February 25th. . . . The Highway Engineers Short Course had a record registration in spite of a heavy snowfall on Monday, February 27th. On another page of this issue, you will find Chief Highway Engineer Ralph Bartelsmeyer's excellent talk. . . . Need applications.

If you wives want to have a little fun, the next time your husband asks you about attending a convention you say, "Sure, go ahead, but don't come back unexpectedly."

The real reason, says a Water Works Superintendent, that the rooster crows so early in the morning is because he's too scared to open his mouth after the old hen wakes up.

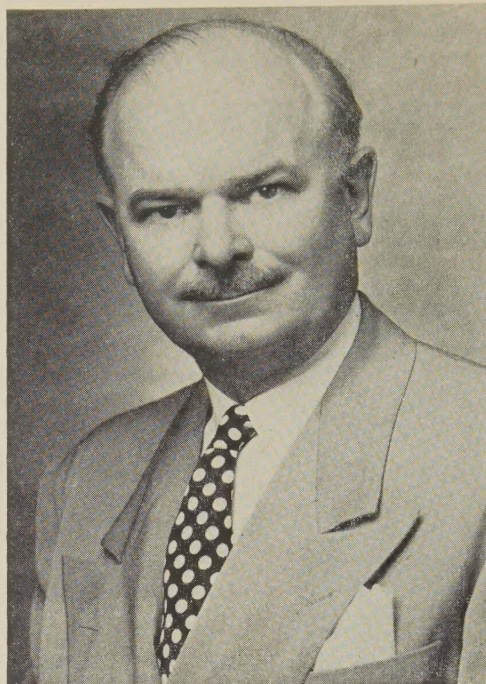
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SPEAKER AT ANNUAL LUNCHEON



Allison C. Neff, President N.S.P.E.

BIOGRAPHY OF ALLISON C. NEFF

President, NSPE

Allison C. Neff of Middletown, Ohio, is a native of Cleveland and a graduate of the Case Institute of Technology from which he received a B.S. in mechanical engineering in 1925.

He began his engineering career as assistant city engineer in East Cleveland. Then he worked as a sales engineer, and later as Cleveland district manager, for The Ohio Corrugated Culvert Company. He joined Armo Drainage & Metal Products, Inc. in 1944 as Ohio sales manager. In the same year he became manager of the firm's Central Division, and in March of 1945 he was promoted to vice president, the position he now holds.

Well known for his professional activities, Mr. Neff has served as president of both the Ohio Society of Professional Engineers and the Cleveland SPE. He has been a member of the NSPE Board of Directors and chairman of both the Ethical Practices and Publications Committees. Currently he is chairman of the Reserve Fund Committee. He is a member of the Professional Engineers Conference Board for Industry, and The Engineering Society of Cincinnati and an associate member of the American Society of Civil Engineers.

In addition, Mr. Neff is noted for his civic activities. From 1944 to 1946, he was a councilman of the City of Shaker Heights and also a member of the City Planning Commission. He is now a member of the City Planning Commission of Middletown, serving as its president in 1952, 1953, and 1954, and also of the Butler County Planning Commission. He is now chairman of the Middletown Industrial Council, and he has served as vice president of the Ohio Highway & Turnpike Association.

Program 71st Annual Meeting

Highland Park—April 12-13-14, 1956

MEN'S PROGRAM

HOSTS: LAKE COUNTY CHAPTER, ISPE

Wednesday, April 11, 1956

Morning

7:30 Registration and Welcome

Thursday, April 12, 1956

Morning

8:00 Registration and Welcome

8:30 Board of Direction Meeting (Members are welcome to attend)

10:30 Free coffee break

10:45 Resumption of Board of Direction Meeting

12:00 Luncheon

Presiding—Dwain M. Wallace PE, President, ISPE

Invocation—Rabbi M. B. Sachs,

Temple Am Echod, Waukegan, Illinois

Welcome—Mr. August Cepen, Chairman, Lake County Board of Supervisors

Introductions

Address—Austin L. Wyman

Chairman, Illinois Toll Road Commission

Afternoon

1:30 Resumption of Board of Direction Meeting

1:30 Inspection Trip—Portland Cement Association Laboratory

2:00 Conference—Consulting Engineers

3:30 Free coffee break

3:45 Resumption of Board of Direction Meeting

Evening

5:30 Cocktail hour

7:00 Dinner

Presiding—S. Danoff, Chairman

Invocation—Right Reverend Monsignor Garrity, Pastor, St. Anastasia Church, Waukegan, Illinois

(Music during dinner)

Address—speaker of national recognition—to be announced later

9:00 Millionaires' Party—

Accordion and violin

Friday, April 13, 1956

Morning

8:00 Registration and Welcome

8:30 71st Annual Meeting of the Society

10:30 Free coffee break

8:30 71st Annual Meeting of the Society

10:45 Resumption of 71st Annual Meeting

12:00 Luncheon

Presiding—Dwain M. Wallace PE, President, ISPE

Invocation—Reverend A. T. Wallace, Madison, Wisconsin

Introductions

Address—Mr. A. C. Neff PE, President, NSPE

Afternoon

2:00 Resumption of 71st Annual Meeting

3:30 Free coffee break

5:00 Adjournment

Evening

5:30 Cocktail hour

Courtesy—Streator Drain Tile Company and Lock Joint Pipe Company

7:00 71st Annual Banquet—dress optional

Presiding—Dwain M. Wallace, President, ISPE

Invocation—Dr. Paul Keller, First Presbyterian Church, Deerfield, Illinois

Introductions

Presentation of Awards—

Honorary Membership

Past President's Certificate

Illinois Award

Address—The Honorable William G. Stratton, Governor of the State of Illinois (Music during dinner)

10:00 Dance—Courtesy—Lake County Chapter

Saturday, April 14, 1956

Morning

7:30 New Board of Direction Breakfast

8:30 New Board of Direction Meeting

10:30 Free coffee break

12:00 Board of Direction Luncheon

Afternoon

1:00 Resumption of Board of Direction Meeting

I hold every man a debtor to his profession; from the which as men of course do seek to receive countenance and profit, so ought they of duty to endeavor themselves by way of amends to be a help and ornament thereunto.

Sir Francis Bacon

SPEAKER AT ANNUAL BANQUET



GOVERNOR WILLIAM G. STRATTON

LADIES' PROGRAM

HOSTS: LAKE COUNTY CHAPTER, ISPE

Wednesday, April 11, 1956

Evening

7:00 to 10:00 Registration and Welcome

General Chairman Ladies Entertainment
Mrs. Sidney Danoff

Most men fall in love with women who ask the questions they can answer.
—CMD Magazine.

BIOGRAPHICAL SKETCH OF GOVERNOR
WILLIAM G. STRATTON

William Grant Stratton was inaugurated as the 32nd Governor of Illinois on January 12, 1953. He is the third youngest governor in the history of Illinois.

He was born at Ingleside in Lake County on February 26, 1914. He received his grade and high school education in Lake County and was graduated from the University of Arizona in 1934 with a degree in political science.

In 1940, at the age of 26, he was elected to the United States Congress from the state-at-large. Following his two-year term in Congress, he was elected Illinois State Treasurer. He volunteered in the U. S. Navy in 1944 and served in the Pacific Theatre of Operations. While he was stationed at Okinawa, friends at home began his second campaign for congressman-at-large. He won that office in 1946. He was elected for a second term as State Treasurer in 1950.

Governor Stratton is married to the former Shirley Breckenridge. He is the father of two daughters, Sandra, 18, and Diana, 15.

Thursday, April 12, 1956

Morning

- 8:00 Registration and Welcome
- 10:30 Tour Bahai Temple (leave hotel 10:00 A.M.)
Card room available for women who do not go on tour.
- 12:00 Luncheon

Afternoon

- 3:30 Eddie Doucette cooking demonstration of TV Station WNBQ

Evening

- 5:30 Cocktail hour with husbands
- 7:00 Dinner, followed by Millionaires' Party

Friday, April 13, 1956

Morning

- 8:00 Registration and Welcome
- 10:00 Tour of Haeger Pottery (leave hotel 9:00 A.M.)
Card room available for women who do not go on tour.

Afternoon

- 1:00 Luncheon
- 2:00 Style Show by Hein's of Waukegan

Evening

- 5:30 Cocktail Hour
- 7:00 Banquet and dance (dress optional)

Saturday, April 14, 1956

Morning

- 8:00 to ? BRUNCH

PRIZES SURPRISES SOUVENIRS

Illinois Society's Participation in National Engineers Week

In General

Engineers Week in 1956 was observed by the greatest number of Chapters using every known medium of communications in their participation.

TV coverage was had in Davenport, WOC-TV; in Decatur, WTVP-TV; in Champaign, WCIA-TV; in Chicago, WBKB-TV; and Champaign-Urbana, WILL-TV. Radio stations all over the state used interviews and prepared tape recordings. Newspaper coverage greatly exceeded expectations. Capital Chapter alone had 561½ column inches including a very well written editorial. Speakers were furnished to service clubs in many cities across the state. Champaign County Chapter had a dinner dance attended by approximately 160 people. Capital Chapter had a banquet with an attendance of 85 and several other Chapters had dinner meetings or cooperated with the Chamber of Commerce.

Space does not permit the full reproduction of all reports; therefore, it was necessary to condense the vast amount of material received.

Capital Chapter

Three local radio stations used the tape recordings, "Project Satellite," "The Engineer Story" and "The U.S.S. Nautilus" plus spot announcements throughout the week. The TV stations used the five one-minute TV films prepared by N.S.P.E. and 561½ column inches of newspaper publicity was used. Past President Virgil Gunlock spoke to the Rotary Club; Carter Jenkins, the Exchange Club; Clarence Klassen, the Kiwanis Club; Elmer Knight, the Lions Club; and Walter Hanson, the Cosmopolitan Club. There were two window displays in the two Public Service Company's windows. A banquet was held and attended by city officials, other engineering organizations, engineers in industry and co-sponsored by the Capital Chapter and Springfield Engineers' Club. Past President Klassen was toastmaster and Past President Gunlock the principal speaker.

Champaign County Chapter

WCIA-TV scheduled the one-minute films sixteen times during the week. A fifteen-minute farm program recounting the history and development of Agricultural Engineering was televised by two members of the Champaign County Chapter, Mr. Frank Lanham and Mr. Ben Muirheid. WILL-TV arranged a thirty-minute panel discussion by Mr. J. Holloway Morgan, who represented Engineers in Government; Mr. Ralph Wilson represented Consulting Engineers; Gordon Carlson, Utility Engineers; James Meek, Builders and Contractors. Also during the week, the Eta Kappa Nu film was shown, the five TV spreads with N.S.P.E. prepared scripts were

shown, two local radio stations both scheduled fifteen-minute interviews between Edward Healey and J. Raymond Carroll, and WILL carried a fifteen-minute interview by Associate Dean Ross J. Martin. Also, there was an excellent window display in a campus book store. The highlight of the week was a dinner dance at the Champaign Country Club attended by 160 members of the Chapter, their wives, and their friends.

CHAMPAIGN COUNTY DINNER DANCE FEBRUARY 23, 1956



Left to right are University of Illinois College of Engineering Dean William L. Everitt, Mrs. Everitt; Executive Secretary P. E. Roberts, Mrs. Roberts; Banquet Chairman Thomas H. Thornburn, Mrs. Thornburn.

Photo by Champaign-Urbana Courier

Central Illinois

The Central Illinois Chapter focused public attention upon the engineering profession during Engineers Week through newspaper, radio, television and by personal contact with the high school student group. Under the direction of Mr. Ralph Grossman, Engineering Week Chairman, and by courtesy of the Illinois Power Company, the film "A for Atom" was presented at all junior and senior high schools in Decatur. The engineering aspects of this film were further outlined in general discussions led by Mr. John Castle. By count, 3,191 students participated in this program. Radio and television time provided by our local stations included the following programs:

WTVP—February 21, 10:10 p.m. (World News Program) Interview of John Housiaux, Chapter President, and Andrew Neureuther, State Society Vice-President.

WSOY—February 22, 4:15 to 4:30 p.m. Panel discussion by Walter Hays and Ed Crawford.

WDZ —February 25, 4:15 to 4:30 p.m. Panel discussion by Parke Boyer and John Castle.

Our Chapter meeting, attended by 67 members and guests, February 23, provided a climax for our Engineers Week Program with Mr. Everett Jones, Chief Lubrication Engineer for the Standard Oil Company, as the guest speaker.

DuKane Chapter

DuKane Chapter had window displays and held a meeting emphasizing the shortage of engineers and urged high schools to guide more young men into engineering careers.

Illinois Valley Chapter

News stories and display advertising were run on three pages of the February 21st issue of the *Daily Republican Times*.

Chicago Chapter

Participation in Engineers Week in various ways including an outstanding interview of National Director George DeMent by the well known radio and TV commentator, Irving Kupeinet.



Chicago Mayor Richard J. Daley presents Engineers Week Proclamation to Past President Virgil E. Gunlock. National Director Wayne W. Wallace (left) and Chicago Chapter President Alois Graf, observers.

Lake County Chapter

Lake County Chapter omitted its news supplement celebrating Engineers Week this year because of its giving its undivided attention to the preparation of the 71st Annual Meeting.

Rock River Chapter

Rock River Chapter had a panel discussion on WOC-TV, Davenport, on Monday, February 20th. E. V. Ellifrit, Division Engineer with Commonwealth Edison, emceed the program and represented Electrical Engineering. Harry Cordes of Dixon represented Consulting Engineers; Tom Kelly, General Electric Company, represented Manufacturing; M. M. Memler, District State Highway Engineer, represented Engineers in Govern-

ment. On February 21st, a half-hour radio panel discussion was aired over WSDR radio. Excellent coverage was given by the area newspapers both with pictures and with news stories. The celebration was climaxed by a banquet on Wednesday, 7 p.m. at the Nachusa House. The principal address was given by Mr. L. B. Cappa, Vice President of the Public Service Company, who spoke on the subject, "Power from the Atom to You." One hundred Engineers Week posters were displayed in business windows in Dixon, Walnut, Princeton, Oregon, and Morrison.

West Central Chapter

West Central Chapter, besides its other Engineers Week participation, cooperated with the Rock River Chapter in the TV panel presentation over Station WOC-TV, Davenport.

AN ENGINEER LOOKS AT HIS PROFESSION AND HIS PROFESSIONAL SOCIETY

By J. HOLLOWAY MORGAN

Back in the big depression of the early thirties, when the nation was wrestling with legislation to alleviate the economic distress by setting up the National Recovery Administration, commonly called the NRA, groups of professional engineers representing the technical societies were rebuffed by Congressional committees time and time again, because they did not represent all engineers. The legislators did not say so, but the engineers found out, that since they were organized upon a national membership basis and not upon a congressional districts basis, they had no direct tie-in to the individual legislator, which greatly weakened their effectiveness. Consequently the state societies of Connecticut, New York, New Jersey, and Pennsylvania got together and organized the National Society of Professional Engineers which was to have a "grass-roots" foundation in local chapters linked together under state autonomous societies, and confederated into the N.S.P.E. Illinois was the first to join.

Then to eliminate duplication of activities as much as possible, and concentrate their energy upon the business side of the Engineers, the new organizations dropped engineering technical subjects except an occasional discourse upon some subject in which all engineers have some interest. Engineers tend to revert to technical subjects upon the slightest stimulus. Like goats, we love papers.

At first the technical societies were hostile to the new organization, although a very high percentage of members in N.S.P.E. were and are also members of one or more technical societies. However, necessity and enlightenment have brought on more and more cordial relations and cooperation.

The business side of engineering has always been slighted by the engineering profession. As this condition

(Continued on page 11)

The Case for Better Highways in Illinois and the Nation

By RALPH R. BARTELSMEYER

When historians write of the twentieth century they will record as one of its marvels, and perhaps the single most distinguishing feature of the American way of life, the story of highway transportation. At the start of the present century there were only about 8,000 motor vehicles in the entire United States. By 1920 the number had increased to slightly more than 9,230,000. Since then, except for slight retrocessions in the early thirties and again during World War II, the number of motor vehicles has steadily increased, until last year the highways of the nation served an estimated 50,954,000 passenger cars, 252,000 buses, and 10,128,000 trucks.

The people of Illinois have played a leading part in this phenomenal development. As the century began there were only a few motor vehicles in this State. By 1920 there were about a half-million. Last year the number of motor vehicles registered in Illinois exceeded 3,268,000.

As the number of motor vehicles increased and technical improvements were made in them by the automotive industry, they changed from a luxury item, enjoyed by only a few, into an essential part of our economy and one of the focal points of our everyday existence. Not only has the motor vehicle assumed a major role in the transportation of the goods and freight of this nation but it has also become an integral part of our family life. It is used daily to transport the head of the family

to work, the children to school, and the housewife to shop. In the families' leisure time, it makes possible social and recreational opportunities the average family never dreamed of thirty years ago.

As the motor vehicle came into greater use not only has the amount of travel increased but the extent of travel has broadened. In 1920, in Illinois, for example, the total vehicle miles of travel were relatively small and confined almost exclusively to city streets and, in good weather, to a few of the better rural roads immediately adjacent to the cities. A trip of fifteen or twenty miles, with a horse and buggy or a passenger car of 1920-1925 vintage was an all-day excursion. Today such a trip takes but a few minutes. Twenty-five or thirty years ago practically all of our inter-city passenger travel was by rail, in trains or interurban cars. Symbolic of the change, just the week before last, the Illinois Commerce Commission authorized the Illinois Terminal Railroad to drop the last of its passenger service that once featured hourly trips between Danville, Champaign, Decatur, Peoria, Springfield, and St. Louis.

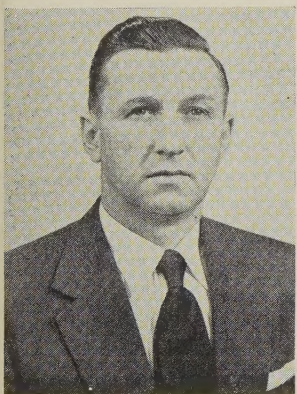
Paralleling this shift in passenger travel to the nation's highways, a substantial portion of the freight that once moved by rail and by water is now carried by the highways. In 1925 there were less than 2,500,000 trucks in the United States and, at that time, trucks having a gross weight of 15,000 pounds, which included the weight of the vehicle and its load, were considered huge. In 1955 there were an estimated 10,128,000 trucks in the United States and gross vehicle weights in excess of 45,000 pounds were not uncommon.

Travel by motor vehicles in 1930, in the United States, totalled about 206 billion vehicle miles. By 1954 the travel had more than doubled with the nation's motor vehicles totalling an estimated 561 billion vehicle miles. Travel on Illinois highways increased at a similar rate. In 1930 motor vehicles in Illinois travelled an estimated 12 billion vehicle miles. In 1955 the estimated amount of travel had more than doubled with Illinois vehicles totalling an estimated 32 billion vehicle miles of travel.

With the growth of highway transportation, the motor vehicle in revolutionizing the living and travel habits of the nation, has also become an integral part of our economy. One out of every six businesses, retail, wholesale, or service is connected with motor vehicles. Directly or indirectly, one-seventh of all gainful employment in the country and about 14 per cent of the total gross national product are attributable to the highway transportation industry. A substantial part of the taxes used for the support of our schools, hospitals, and national defense are collected from sources having their roots in the highway transportation industry.

ABOUT THE AUTHOR

Ralph R. Bartelsmeyer before becoming Chief Highway Engineer, Illinois Division of Highways, was St. Clair County Superintendent of Highways. After his graduation from the University of Illinois College of Engineering, Civil, he was employed in the Division of Highways in the Peoria District.



Ralph R. Bartelsmeyer

In 1924, Governor Small's Administration sponsored a 100-million dollar bond issue hard road building program. The size of the project startled many taxpayers. Today under the direction of Mr. Bartelsmeyer, the Division of Highways is spending at the rate of 100 millions per year for construction and improvements. The talk as printed here was given on February 29th at the 42nd Annual Highway Conference at the University of Illinois.

As our economy continues to grow and expand the number of motor vehicles and the miles of travel will continue to increase. Federal economists predict an additional 20 million motor vehicles on the nation's highways by 1965 and almost 200 billion more vehicle miles of travel, thus placing additional demands upon our already over-burdened and out-moded highways.

Responsibility for the highways of the nation is shared, in varying degrees, by the various governmental units. In 1916, the Federal Government initiated a program of sharing with the states, the construction cost of a designated system of Federal-aid highways. From a national standpoint the Federal-aid Highway System, of approximately 235,000 miles of primary roads, and 435,000 miles of secondary, or farm-to-market roads, is the backbone of the highway system serving the transportation needs of the country.

From the 235,000 miles of Federal primary highways, Congress, in 1940, established a 40,000-mile National System of Interstate Highways connecting the principal cities and other strategic places in the nation. Although the National System of Interstate Highways comprises only 1.2 per cent of the total road and street mileage in the nation it carries more than one-seventh of all vehicular traffic.

There are approximately 123,000 miles of public highways in Illinois of which about 12,300 miles in rural and urban areas are the primary responsibility of the State. These roads, most of which carry either a U.S. or Ill. traffic route marking, form a State-wide network serving traffic between the cities, towns, and villages in all parts of Illinois. Of the 12,300 miles of highways under State control, about 9,800 miles are also a part of the Federal-aid primary highway system and about 1,500 miles are a part of the National System of Interstate Highways.

In Illinois during 1955, the 12,300 miles of rural and urban highways under the jurisdiction and control of the State carried almost 16 billion vehicle miles of travel, about half of the total travel in the State.

Next in importance, in this respect, were the 19,000 miles of streets in incorporated areas, under the jurisdiction of the municipalities on which there were approximately 12 billion vehicle miles of travel.

The remaining 4 billion vehicle miles of travel were about evenly divided between the 18,000 miles of rural highways under the jurisdiction of the counties and the 73,000 miles of township roads.

A number of factors have contributed to the highway problem. As great as the increases have been in the number of motor vehicles and miles of travel, they do not tell, in full, the story of the increased demands on our highways. The increased weight of all vehicles, the higher operating speeds, and the heavier axle loads have caused many miles of highways, built to meet the vehicle standards and operating conditions of the thirties, to become obsolete, functionally and structurally.

Another factor contributing to the huge backlog of improvement needs now confronting us is the age of our

highways. Unfortunately, not even a concrete pavement lasts forever and as the highways become older and are subjected to increased usage their deterioration increases rapidly.

The people of Illinois were among the first in the nation to meet the demand for better highways by their approval of bond issues, of \$60 and \$100 million, in 1918 and 1924, for the construction of a State-wide system of hard roads. As a result of this action Illinois once had the best highway system in the country. But today, also as one of the results of having been one of the pioneer states in the "good roads" movement, Illinois has a relatively old highway system.

Between 1920 and 1930 over 7,000 miles of concrete pavements were constructed on the State system. At the present time there are over 3,900 miles of such pavements, more than 25 years old, still in service. During the last ten years the mileage of pavements exceeding twenty-five years in age has been increasing far in excess of the mileage of pavement rehabilitated or rebuilt.

Each day the nation's highway users pay a heavy penalty as they use obsolete and dangerous roads. While it is not possible to pinpoint the cause of every motor vehicle accident, the use of out-moded highways by today's larger and high speed motor vehicles is a contributing factor to the ever increasing number of accidents, loss in lives and resultant economic loss in dollars. In 1954, the estimated economic loss due to accidents, on Illinois highways alone, exceeded one-quarter of a billion dollars, almost three times as much as the State has ever spent in a single year for construction.

The U. S. Bureau of Public Roads has estimated that the modernization of the Interstate system alone would save 3,500 lives a year. In terms of money it has been estimated such modernization would annually save \$550 million in vehicle operating costs, \$725 million lost in accidents and \$825 million in commercial vehicle time, a total of \$2,100 million a year, an amount which over a ten-year period would almost equal the estimated improvement needs of the Interstate system.

Another factor contributing to the present highway dilemma has been our failure to meet the needs as they occurred. Since the end of World War II vehicle registration and miles of travel in the State and the nation have increased almost 100 per cent over the peak reached in 1941 just before the war. During the same period of time expenditures for roads and streets in the nation and in Illinois have also increased. However, due to the decrease in purchasing power the dollar buys only about half as much construction today as it did before the war. In terms of the 1941 dollar, nation-wide expenditures for roads and streets barely exceeded the pre-war level. In Illinois, thanks to the greatly accelerated construction program of the last three years, the picture has been a little brighter but even so the expenditures have fallen far short of the needs. While our construction expenditures in 1953, 1954, and 1955 were approximately 80 million, 97 million, and 96 million dollars, in terms

of the 1941 dollar they purchased only 43, 52, and 51 million dollars worth of highway improvements.

Any consideration of the highway problem must, of course, take into consideration the financial resources of the people. In Illinois, the most critical problem exists on the roads and streets comprising the primary highway system. Practically all funds expended on these highways are derived from three principal sources:

- (1) An annual State license or registration fee assessed the owner or operator of every motor vehicle in Illinois dependent upon the character and size of the motor vehicle;
- (2) A 5¢-a-gallon State tax on all motor fuel sold in Illinois and used on the highways; and
- (3) Reimbursements from the Federal Government to pay the Federal share of construction on Federal-aid highways in accordance with Federal regulations under the terms of the Federal-aid highway law.

The revenue derived from vehicle registration fees and motor fuel taxes is directly dependent upon the number of vehicles and miles of travel hence increases in these sources also indicate increased road usage. The amount of Federal funds available for highway construction is dependent upon the action of the Federal Congress and must, in most cases, be matched with an equal amount of State money.

During 1955, the State income for highway purposes totalled \$242 million of which \$125 million were motor fuel taxes, \$75 million license fees, \$35 million Federal-aid reimbursements and \$7 million miscellaneous collections such as fines and penalties and reimbursements from other governmental units.

But all the funds collected from highway users are not available for the improvement of the highways. Before any of the State-collected money can be used for highway construction there are certain fixed expenditures which must be made. The cost of collecting the taxes, of operating other State departments performing functions related to the highway field, of policing and maintaining the highways, and the overhead expenses of the Division of Highways must be paid.

In addition to the payment of the expenses incident to the collection of taxes and the operation of the highways, a part of the motor fuel taxes collected by the State have been earmarked by the Legislature for use by the cities, counties, and townships on the roads under their control.

In 1955 road user funds were expended as follows:

Collection costs and policing highways.....	\$ 13 million
Bonds and other highway administrative expenses..	22 million
Aids to local governments (MFT to cities, counties and townships).....	80 million
Maintenance of State highways.....	24 million
Construction.....	96 million

Total expenditures.....	\$235 million
Gain in balance.....	\$ 7 million

The gain in balance does not indicate that the State is receiving more money than it needs or can spend but is due entirely to the timing of payments for construction and other expenses. Actually at the close of 1955 there was an unencumbered balance of about \$17,400,000 in the Road Fund against which there was \$53,818,000 in contracts outstanding.

The rapid growth in highway usage, as reflected by the ever greater number of motor vehicles crowding the highways, the steady annual increase in vehicle miles of travel, the rapid rate at which the highways are aging, and the decrease in the purchasing power of the highway dollar since World War II have resulted in a tremendous backlog of construction needs almost beyond comprehension.

To determine just how large this backlog had become and to ascertain how great the future construction needs on the nation's highways would be, during the summer of 1954, the U. S. Bureau of Public Roads, in accordance with a directive in the 1954 Federal-aid Highway Law, conducted a nation-wide study of the highway improvement needs in the United States. At the same time, the Illinois Division of Highways was completing a similar study for Illinois roads and the data collected in the Illinois study was incorporated into the Federal study.

The Federal study found the 10-year construction needs (for the period 1955 to 1964) on all roads and streets in the United States to be \$101,365 million distributed among the several road systems (according to Federal classification) as follows:

Interstate	
Rural.....	\$ 13,052 million
Urban.....	10,862 million
Other Federal-aid	
Primary Rural.....	19,887 million
Primary Urban.....	10,035 million
Secondary.....	14,876 million
Other Rural Roads.....	17,073 million
Other City Streets.....	15,580 million
Total.....	\$101,365 million

The Illinois highway improvement needs, included in the national total and for the same period of time, amounted to \$4,735 million dollars distributed among the several road systems (according to State classification) as follows:

Primary Highway—State System	
Interstate Rural.....	\$ 830 million
Interstate Urban.....	602 million
Other State Rural.....	968 million
Other State Urban.....	501 million
Total State primary highways.....	\$2,901 million
Counties.....	\$ 202 million
Cities.....	1,330 million
Townships.....	302 million
Total.....	\$4,735 million

In general, while the needs in total are staggering, our experience in Illinois, in such studies over the last twenty

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years, leads us to believe the estimate to be on the conservative side.

To serve today's highway user and to meet the demands of tomorrow's motorist, the Federal Government and the several states have collaborated in devising standards of design and construction which not only will afford every feature of convenience and safety possible to the highway user but which also will represent the wisest possible investment of every highway dollar not only for today but also during the years to come.

The type of highway improvement required depends upon the traffic using the highway. The number of traffic lanes and width of bridges and structures are dependent upon the volume of traffic while other geometric features such as sight distance, grades, and curves depend upon the speed and other operating characteristics of the vehicles.

In general, the same design standards are used for all highways on the State primary system. However, on those routes forming a part of the Interstate system, and on other highways designated as freeways, access to the highway will be controlled and adequate frontage roads or service drives constructed where necessary. According to present design standards, two-lane highways will consist of two traffic lanes, ten to twelve feet wide, with adequate shoulders or parking lanes. On those highways where the traffic volume warrants more than two-lane construction, directional roadways will be built consisting of at least two traffic lanes, twelve feet wide, with adequate shoulders or parking lanes, and in rural areas, separated by a parkway at least 30 feet wide.

In estimating the future highway speeds and in devising annual construction programs every effort is made to salvage as much of the existing highway as possible. We have been able in Illinois to rehabilitate many miles of the primary highway system by resurfacing (and widening where necessary) existing pavements with two to three inches of bituminous material.

On new highways and relocations, or where the existing pavement is not adequate for resurfacing, the highway constructed consists of an 8 to 10 inch pavement on a 6 inch granular base.

In all cases shoulders, bridges, traffic structures and other features are improved or built to adequate standards dependent upon the volume and operating characteristics of the traffic using the road.

In conclusion the case for better highways in Illinois and the nation is well established. The crowded condition on the highways, the terrific annual toll of lives, and property damage lost in motor vehicle accidents, the age of the highways now in use, the annual economic loss in vehicle operating costs and time, and additional demands of tomorrow's increased number of motor vehicles and miles of travel establish, beyond doubt, the urgent need for highway improvements. During the last three years, in an all-out effort to meet these needs, we have, in Illinois, expended over a quarter of a billion dollars for highway construction on the primary system alone. But, at that rate of expenditure, as indicated by the 1954 needs study, it would take about thirty years in Illinois to retire the 10-year improvement needs of the primary highway system. Obviously, if our past progress in highway transportation is to continue, additional funds must be provided. Based on the use characteristics of the traffic on the highways, financial responsibility for the construction of the National Interstate System of Highways should be borne, almost in total, by the Federal Government while financial responsibility for the remainder of the Federal-aid highway system should be shared jointly by the states and the Federal Government. For this reason, and also to insure uniformity of design and construction, by the several states, it is imperative that the highway legislation now before the Congress, providing for the construction of the Interstate System in approximately 13 years, and increasing annually allotments for the Primary, Urban and Secondary Systems be enacted into law this year.

AN ENGINEER

(Continued from page 6)

more widely appreciated among engineers, more of their time and money will be put into it.

The national total of professional engineers has been estimated at about 400,000; of these the National Council of State Boards of Engineering Examiners has estimated that 197,000 of them are eligible for registration. The total registration for the nation was 176,000 in 1952. There are 36,000 members in N.S.P.E.; 1,440 in the Illinois Society of Professional Engineers out of a possible 7,000 who are registered by this state, and there are a little over a hundred in our local chapter.

We began our activities by preaching to engineers the need of a business organization with an ethical, social and economic cast, and embracing all professional engineers regardless of specialties. We also began pushing for registration of professional engineers in all states. We have attained the latter. Our committees on legislation are continually watching legislation to see that those laws are not weakened and seeking ways to strengthen those which need improvement. We have urged engineers to take a more active part in civic and governmental affairs and we have endeavored to encourage and support those who have. We endeavor to get the faculties of engineering colleges to implant in the students a consciousness of approaching a profession in contradistinction to obtaining a means of making a living. In cooperation with the engineering schools we have fostered refresher courses through classes for engineers who are preparing for examinations for registration as professional engineers, or structural engineers or land surveyors. In Illinois alone over 3,000 have attended 130 such classes.

We have entered the high schools to interest more students in the physical sciences and mathematics to help in alleviating the shortage of scientific personnel in the contemporary national economy.

The N.S.P.E. has a research project which has been active throughout the last four years, analyzing personnel management problems of engineers in industry, which has resulted in published reports. These have been distributed to executives who may find them helpful in improving the use of existing engineering talent. Such improvement will enhance professional status.

N.S.P.E. has a very competent national staff in Washington, D. C. under the direction of Paul H. Robbins, who is a professional engineer. The staff watches public relations and assists the state societies. It appears before Congressional committees with testimony for or against bills affecting engineers. It offers recommendations for clarifying involved problems of engineer personnel; and it is frequently called upon for facts and opinions.

A permanent home for our Washington staff has been in the building during the past two years financed by bonds subscribed to by engineers.

Ethics and practice are watched and acted upon at all levels. Malpractice is something that we do not like to

talk about, but which cannot be ignored. Usually our committees on the subject can handle such cases successfully privately and without publicity. This is the most satisfactory way. However, it has the disadvantage that even our own members are unaware of the work and success that have been accomplished.

These are the highlights of our accomplishments. In my opinion, our activities have been efficiently handled and have accomplished as much as one should expect for the amount of money engineers have put into them.

Where do we go from here? Certainly we cannot do less. We cannot rest on the past. We must push forward. Engineers in industry, public utilities and government are facing an intensified drive to impress them into labor unions. Are we going to acquiesce to 400,000 engineers being submerged by the 16,000,000 members of labor unions?

We white-haired members have been serving you for a long time, we have been honored by you and we thank you for your confidence and appreciation. However, we are anxious to see more of you younger men volunteer to carry the ball—to get on committees, to take a more vigorous part all around. It is from these men your organizations must select the leaders to a brighter future.

WELDING PROGRESS AWARDS

The James F. Lincoln Arc Welding Foundation of Cleveland, Ohio is offering \$20,000 in cash awards for ideas or suggestions that will accelerate progress in arc welding. Residents of the United States or its possessions are invited to submit ideas to the Foundation on any aspect of arc welding that can be used to advance welded design, welding engineering or the general application of the arc welding process. No restrictions are placed on either the nature or the extent of ideas that may be submitted for award. The \$20,000 will be distributed in 20 awards with a top award of \$5,000, others of 4, 3, 2 and 1 thousand dollars and additional smaller awards. Ideas must be submitted by July 30, 1956.

Dr. E. E. Dreese, Chairman of the Foundation, describes the offer as an exploratory program to discover ways in which arc welding can continue to progress. Welding is widely used in making machinery of all types, erecting buildings, bridges and other structures and for maintenance work, generally in industry, business and farming. The Foundation, Dreese states, seeks to stimulate continuous progress in all of these fields by exploring all ideas which will contribute to the objectives for which the Foundation was established in 1936.

Complete information and rules are available from The James F. Lincoln Arc Welding Foundation, Cleveland 17, Ohio.

A Kentucky colonel always closed his eyes when he took a drink. When questioned concerning his habit, he explained: "The sight of good liquor makes my mouth water, suh, and I do not like to dilute my drink."

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COST OF LIVING INDEX

The cost of living correction factor to be applied to the I.S.P.E. Schedule of Minimum Fees and Salaries is based upon the Consumer Price Index of the 1947-49 average as determined by the Bureau of Labor Statistics. On the 1947-49 base the correction factor for January, 1956, is 114.6.

A ditch digger got a dollar too much in his pay envelope and didn't say anything. The next week the paymaster, discovering the error, deducted a dollar.

"Say," the ditch digger said. "I'm a dollar short."

"Well," said the paymaster, "you didn't complain last week when you were a dollar over."

"Yes," said the ditch digger, "a guy can overlook one mistake, but when it happens again, it's time to complain."

Use of this space is limited to members and associates of the Society. This is a dignified and excellent way to let engineers know that your firm can always accept another account. The price is very reasonable. A card or letter to the Secretary, 614 East Green Street, Champaign, Illinois, will bring full details.

Long-winded speaker: "Mr. Chairman, there are so many rude interruptions, I can hardly hear myself speaking."

Listener (in rear of room): "Don't let it bother you; you're not missing anything."

Remember! Many a good-looking summer cucumber gets into a pickle before winter.

—McWane Pipe Pointers.

ON THE LIGHTER SIDE

Every once in a while, a person runs across an article which he would like to pass along to his friends. Such a thing recently happened to Vice President Royce Johnson, and upon writing to the publication for permission to use it, they referred him to the author of the letter. Most of her letter is reproduced below. The only parts deleted were those parts which specifically referred to her correspondent in Philadelphia.

The thanks of the Editor and the members of the Illinois Society to Mrs. Rhoads for permission to use her entertaining, thought-provoking letter.

"My Dear Friend,

"An engineer is the product of the most practical of forces—more so probably than that found in any other of the professional outlets. He has no need for the feel of applause, and hence, has made no demand. When accuracy, foresight and inventive genius are creating a kaleidoscope in a man's mind, he is apt to be so intrigued by the brilliance and the angles that acclaim leaves him negative. The engineer himself completely overlooks asking for professional splendor, hence there is no panorama of glory to attract the young man selecting a profession.

"Most surely there is little, if any, advertising on behalf of this profession—we, the beneficiaries, of its far-reaching results are scarcely cognizant of our debt for safety, progress and added leisure; and these facts are probably destined to remain in the dark, for there will be no loud noises from the engineer.

"This man subsists, usually, on an average comfortable salary. Many other professions are more lucrative, but when a man can see the creature of his ingenious design get up and move around, he has something more than is gathered from the mere receipt of gold. In that delight is lost the stamina for demand of loud acclaim. An engineer is of stern stuff—much like 'The Reading Boy' and nothing can make him turn his head or lose his place. (Read Nathalia Crane's 'The Reading Boy.')

"If you can get behind the facade of this strange and wonderful creature—the engineer—you will be rewarded with a sense of humor very sharp and keen and straightforward. But once you have contacted it, bring it out where you can cope with it. To illustrate a point—when I find the haze of engineering ether has my engineer too engrossed, I give him a poem (hobby of mine). After several evenings of sitting in my living room (up to my neck in imaginary water) while a swimming pool was being born, I came up with this:

Pa-Pa designed a swimming pool
With the greatest kind of care.
He used most every kind of tool,
And tore out all his hair.

He assembled board and pencil
On the dining table there—
Made preliminary stencil—
With notations everywhere.

His steel tape and his slide rule
He wore into disguise—
And I saw that paper swimming pool
Transpire before my eyes.
He could not be diverted
And was just a mite displeased—
Not to mention disconcerted
At our vain attempts to tease.
To show him that my very mood
Was one of deep accord—
I posed—as any diver should—
On an unseen diving board.
But Pa-Pa deep in the coma
Of some intricate design
Loses all his sense of humor
For any joke of mine.
But he claims he lost his reason—
His propriety to-boot—
When I came down to breakfast
In a bright red bathing suit.

"With good nature my husband admitted that I had no doubt been banging on the door of his retreat—and justly so. Since I was an engineering secretary—most familiar with terminology, language and temperament of engineers as a whole—I can easily realize that the rest of us live in an inhibited narrow realm, while the engineer has but to step over a threshold into a vast expanse of unknown where he can search to his heart's content the mysteries of things to come.

"Such is the man whom I pull back with my jesting—and like a real sportsman, he will take part in the fun—but watch out, for when I relax my hold upon him, he will creep quietly back into his wide inviting exploration and softly close the door behind him.

Very sincerely,

(Signed) MRS. LOY D. RHOADS
Marion, Ohio"

When a through highway is open, it's probably because they're repairing the detour.

Woozy Ditch Digger, celebrating Saturday night: "Shome sho-an-sho shtole my shteeing wheel out o' thish car."

Construction Foreman: "Take it easy, Mac. Just crawl up into the front seat and you'll find it."

Everyone likes to see a broad smile—especially if she smiles at him.

ODDITIES ABOUT ANIMALS

The baby hippopotamus weighs about 100 pounds at birth and can swim before it can walk.

The beaver is the largest North American rodent and one of the most valuable furbearers.



I.S.P.E. 71st ANNUAL CONVENTION

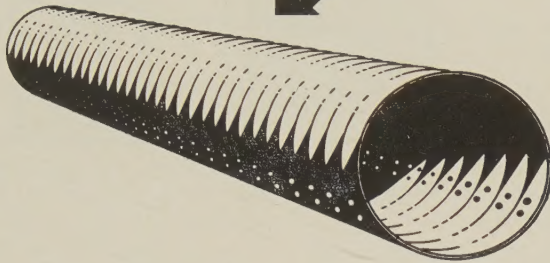


The Lake County Chapter cordially invites you to attend the 71st Annual Convention to be held on April 12, 13, and 14, 1956, at the beautiful Hotel Moraine on the lake in the City of Highland Park, Illinois. Spend 3 days at this showplace of the North Shore and go home refreshed, relaxed and satisfied.

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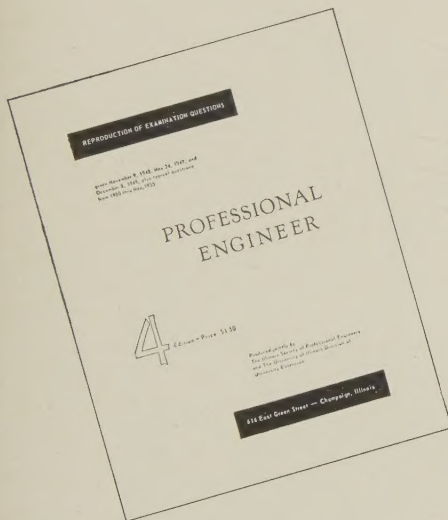
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